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Manual for Trainers in Adapted Sports Dedicated to Persons with Chronic Health Conditions

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THE MANUAL IN BRIEF

MoveUP project encourages the participation of individuals with chronic health conditions (CHC) in recreational adapted sports. Trainers are required to possess specialized knowledge regarding the physiological and psychological aspects of these conditions, which include understanding symptoms, complications, and management strategies for Type 2 diabetes (T2D) and Hypertension. This knowledge enables trainers to create customized exercise programs that cater to individual needs, ensuring safety and efficacy.

This manual serves as a comprehensive guide for trainers involved in adapted sports for individuals with chronic health conditions (CHC), particularly focusing on T2D and Hypertension. The MoveUP project aims to enhance the engagement of individuals with CHC in recreational sports, emphasizing the importance of specialized knowledge for trainers and coaches to ensure safe and effective training and competition experiences.

Objectives of the Manual

- **Educate Trainers:** Provide in-depth knowledge about T2D and Hypertension, including their causes, symptoms, and management strategies.
- **Promote Best Practices:** Encourage trainers to stay updated with the latest research and guidelines in the field.
- **Enhance Communication:** Develop strong communication skills among trainers to foster supportive environments.
- **Encourage Adapted Sports:** Highlight the benefits of adapted sports for individuals with CHC and provide guidance on safe incorporation into exercise regimens.
- **Foster a Positive Attitude:** Promote empathy and positivity in trainers to inspire confidence in their trainees.
- **Provide Practical Tools:** Offer resources such as pre-training assessments and adaptable exercise plans for effective program design.

Understanding Chronic Health Conditions

Chronic health conditions, particularly T2D and Hypertension, require trainers to have a thorough understanding of their management. T2D affects approximately 74 million adults in the WHO European Region, with a significant percentage undiagnosed. Managing this condition includes monitoring blood glucose levels, adhering to a balanced diet, and engaging in regular physical activity.

Hypertension affects 20–30% of the adult population in many EU countries and can lead to serious health complications. Effective management involves lifestyle changes, including regular physical activity and dietary adjustments.

Benefits and Barriers of Recreational Sports

Engaging in recreational sports offers numerous benefits for individuals with CHC, including improved physical health, reduced symptoms of anxiety and depression, and enhanced social interaction. However, barriers such as physical limitations, psychological fears, and societal attitudes can hinder participation.

To overcome these barriers, the manual suggests:

- Developing adaptive sports programs to cater to individual needs.
- Educating sports facilitators and peers about the requirements of individuals with CHC.
- Building support networks within sports programs to provide emotional encouragement.

Understanding Adapted Sports

Adapted sports are modified activities designed to meet the needs of individuals with CHC. The manual emphasizes the importance of these sports for promoting regular physical activity and improving overall health. Examples include walking football, walking basketball, and catchball, which provide a safe environment for participation.

Training for People Living with CHC

Implementing adapted sports requires careful pre-training assessments and collaboration with healthcare providers to ensure safety. Effective training strategies include incorporating a variety of exercises, using adaptive equipment, and encouraging self-management of health conditions. Step-by-Step Training Plans are added; the manual includes detailed training plans for walking football, walking basketball, and catchball, emphasizing gradual intensity increase and skill-building exercises tailored to individual capabilities.

Safety Considerations

Trainers must adhere to specific guidelines to ensure the safety of individuals with CHC during exercise sessions. This includes monitoring vital signs, ensuring proper hydration, and creating a supportive training environment.

Conclusion

The manual concludes that training individuals with Diabetes Type 2 and Hypertension in recreational sports requires a comprehensive understanding of these conditions and thoughtful planning. By following the guidelines provided, trainers can enhance the health and well-being of participants through adapted sports.

Resources

The manual also includes references to various organizations and additional resources for trainers seeking more information on managing exercise for individuals with CHC.

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Introduction

MoveUP project is about Involving in recreational adapted sports individuals with chronic health conditions (CHC) such as Type 2 Diabetes (T2D) and Hypertension. This idea requires specialized knowledge and skills for the entire personnel assuming the task, but most of all for sport trainers and coaches.

The present ***Manual for Trainers in Adapted Sports Dedicated to Persons with Chronic Health Conditions*** aims to provide trainers with guidelines, strategies and best practices to ensure safe and effective training stages and friendly competitions for their trainees.

It is generally agreed that training persons with chronic health conditions (CHC) requires a comprehensive understanding of the physiological and psychological aspects of these conditions. It is imperative for trainers to be well-versed in the symptoms, complications, and management strategies associated with CHC, mostly T2D and Hypertension. This knowledge will allow trainers to create customized exercise programs that cater to the unique needs of each individual, ensuring safety and efficacy.

More than following the guidance of the ***Manual for Trainers in Adapted Sports Dedicated to Persons with Chronic Health Conditions***, in order to be effective, trainers and coaches should adopt the following strategy lines:

- **Staying updated** with the latest research and guidelines on exercise and chronic health conditions.
- **Participating in continuous education** and professional development opportunities related to CHC and adaptive sports.
- **Building strong communication skills** to effectively interact with individuals and understand their needs and concerns.
- **Fostering a collaborative relationship with individuals**, encouraging them to take an active role in their fitness journey.
- **Maintaining a positive and empathetic attitude** that inspires confidence and trust in the individuals they train.

Chapter 1

Scope and Objectives of the Manual

The primary scope of the MoveUP ***Manual for Trainers in Adapted Sports Dedicated to Persons with Chronic Health Conditions*** (“Train the Trainers”) is to serve as a comprehensive guide for trainers working in recreational sports dedicated to individuals with chronic health conditions, specifically T2D and hypertension. By focusing on these conditions, the manual aims to provide trainers with the knowledge and tools necessary to create safe, effective, and enjoyable exercise programs tailored to the unique needs of these individuals.

Objectives

- **Educate Trainers:** Equip trainers with in-depth knowledge about T2D and hypertension, including their causes, symptoms, and management strategies. This will enable trainers to understand the specific needs and limitations of individuals with these conditions.
- **Promote Best Practices:** Encourage the adoption of best practices in the training of individuals with chronic health conditions, emphasizing the importance of staying updated with the latest research, guidelines, and continuous professional development.
- **Enhance Communication:** Develop strong communication skills among trainers to effectively engage with individuals, understand their concerns, and foster a supportive and collaborative environment.
- **Encourage Adapted Sports:** Highlight the benefits of adapted sports for individuals with T2D and hypertension and provide guidance on how to safely incorporate these activities into regular exercise regimens.
- **Foster a Positive Attitude:** Promote an empathetic and positive attitude among trainers to inspire confidence and trust in the individuals they train, ultimately enhancing their overall fitness journey.
- **Provide Practical Tools:** Offer practical tools and resources, such as pre-training assessments and adaptable exercise plans, to help trainers design and implement effective programs that cater to the diverse needs of individuals with chronic health conditions.

Chapter 2

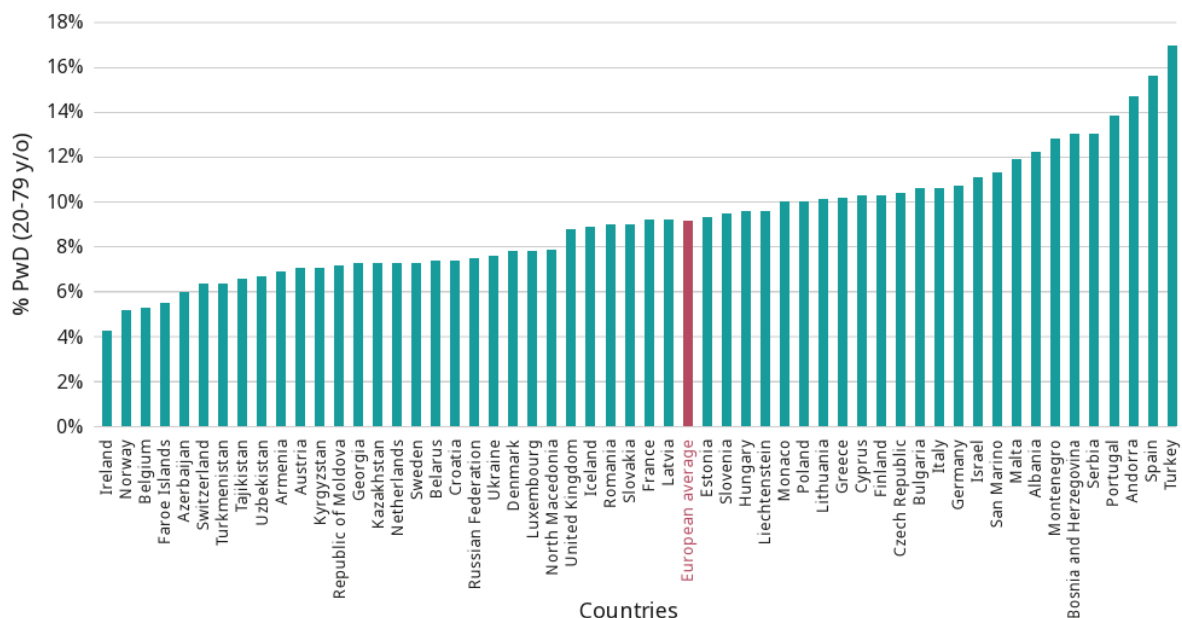
Understanding Chronic Health Conditions

Chronic Health Conditions are long-term ailments that typically progress slowly over time and may require ongoing medical attention and care. These conditions can significantly impact an individual's quality of life, daily activities, and overall health. The MoveUP manual specifically addresses two prevalent chronic health conditions: T2D and hypertension. Understanding these conditions is crucial for trainers to design and implement effective exercise programs that address the unique needs and limitations of individuals affected by them.

Type 2 Diabetes

Approximately 66 million adults in the European Region (conforming to IDF atlas- see figure bellow)) are living with diabetes, accounting for around 10% of the adult population. An estimated 1 in 3 people with diabetes remain undiagnosed, so the percentage could be greater. T2D accounts for about 90% of all diabetes cases.

Chart 3. Diabetes prevalence across Europe, by country, 2021



Between 1990 and 2019, all EU countries experienced increases in type 2 diabetes prevalence. Notably, Luxembourg, with a very low rate initially, saw a 269% increase among

males and 219% among females. Despite rising prevalence, mortality rates have generally decreased, with countries like the UK and Cyprus observing significant reductions.

T2D is a metabolic disorder resulting from the body's ineffective use of insulin, known as insulin resistance, combined with relative insulin deficiency, leading to elevated blood glucose. It is the most common form of diabetes, often associated with older age, obesity, physical inactivity and genetic predisposition. Managing T2D requires a comprehensive approach that includes monitoring blood glucose levels, maintaining a **balanced diet**, engaging in regular physical activity, and, when necessary, taking medication. It is crucial for individuals with T2D to understand how different foods and exercises affect their blood glucose levels. Carbohydrate intake may be a focus for some, as it has the most significant impact on blood glucose levels. A diet rich in whole grains, fruits, vegetables, lean proteins, and healthy fats can help maintain stable blood glucose levels.

Regular physical activity helps improve insulin sensitivity, allowing cells to use available insulin more effectively. It also aids in weight management, which may be important for some people living with diabetes T2D, as excess weight can exacerbate insulin resistance. Aerobic activity, such as walking, cycling, and swimming, along with resistance training, can be particularly beneficial. However, it's essential to tailor physical activity to individual capabilities and preferences to ensure sustainable participation and success.

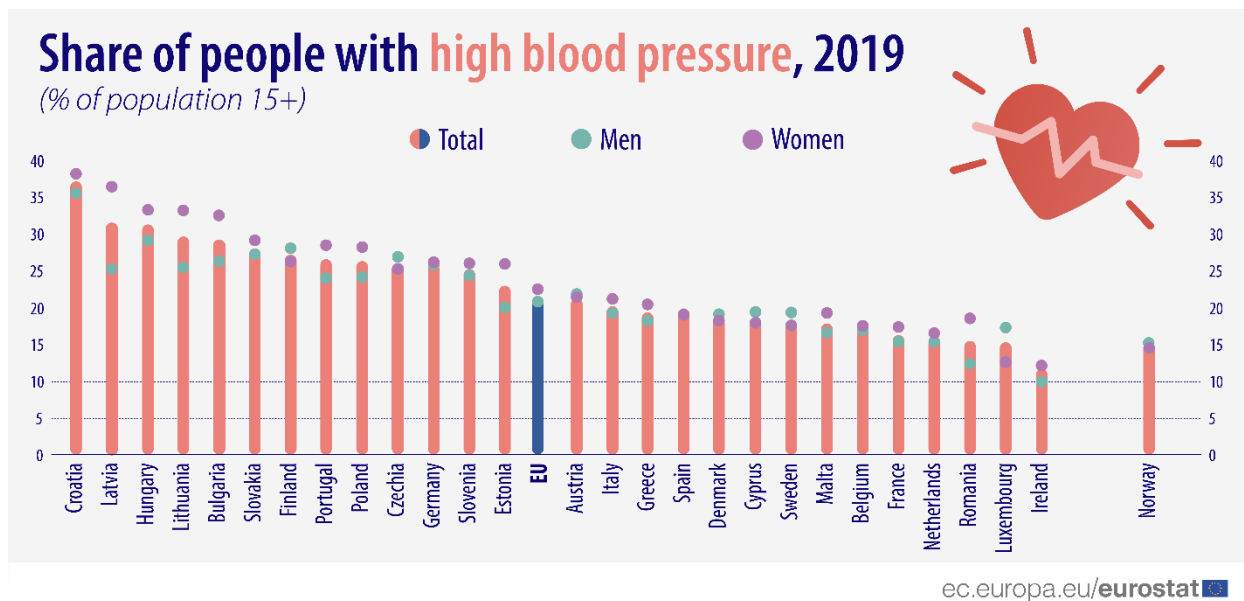
In addition to diet and physical activity, **medication** may be necessary to manage blood glucose levels effectively. Sometimes insulin therapy is required as additional support in managing their blood glucose levels.

Education and support play crucial roles in managing T2D. Individuals should be encouraged to attend diabetes education programs to learn about their condition, self-management techniques, and the importance of regular monitoring. Support groups and counseling can also provide valuable emotional support and practical advice, helping individuals stay motivated and engaged in their management plans.

Hypertension (High Blood Pressure)

Roughly **20–30%** of the adult population in most EU countries has hypertension, with higher rates (30–37%) in **Eastern and Southern Europe** (e.g., Croatia, Latvia, Hungary), but many people are unaware they have hypertension, especially in early stages.

Prevalence increases significantly with **age**, with **obesity and poor diet**: (high salt intake, low fruit/vegetable consumption, sedentary lifestyle). **Alcohol & smoking** are widely recognized as risk enhancers in many parts of Europe. Studies also revealed strong links between low income/low education and higher hypertension rates.



Hypertension is characterized by persistently high blood pressure levels, which can lead to cardiovascular diseases, stroke, and kidney problems. Managing high blood pressure, also known as hypertension, involves a combination of lifestyle changes and medication. One of the most effective lifestyle changes is incorporating **regular physical activity** (brisk walking, cycling, swimming, low-impact sports). These aerobic exercises help strengthen the heart, improve cardiovascular health, and reduce blood pressure.

Apart from exercise, other lifestyle changes such as maintaining a **balanced diet**, reducing sodium intake, managing stress, avoiding tobacco use, and limiting alcohol consumption are crucial. These changes, combined with **medications** prescribed by a healthcare professional, can help effectively manage blood pressure levels and reduce the risk of cardiovascular diseases, stroke, and kidney problems.

Before starting any exercise program, individuals with CHC should consult with their healthcare provider to receive medical clearance and discuss any necessary precautions. A thorough pre-training assessment, including health history and current fitness levels, can aid trainers in designing a tailored exercise regimen that ensures safety and effectiveness.

It is imperative for trainers to recognize the symptoms and complications, to cope with management strategies associated to chronic health conditions (CHC).

For example: trainers should understand that physical activity may result in fluctuating blood glucose levels for someone with T2D (particularly if they are using insulin or certain types of medication). Trainers should be aware they may need to support the person with T2D to manage these fluctuations by supporting blood glucose monitoring and

management of hypo- and hyperglycaemia. Further details on how to effectively support someone in these situations is provided in Chapter 6. blood glucose level

Furthermore, trainers should recognize the significance of physical activity in improving insulin sensitivity and promoting weight management. Although all sports proposed by MoveUp project are team sports, trainers should have the ability to tailor programs to individual capabilities and preferences, for ensuring long-term adherence and success.

In the case of Hypertension, trainers need to be knowledgeable about the impact of persistently high blood pressure levels and their potential to cause cardiovascular diseases, and strokes. They should emphasize the importance of regular physical activity in managing hypertension and be proficient in advising on low-impact aerobic exercises. Additionally, trainers should guide individuals in making other lifestyle changes such as reducing sodium intake, managing stress, avoiding tobacco use and limiting alcohol consumption.

Trainers should also be prepared to understand medication considerations along exercise programs when necessary. They must know how various medications can affect exercise tolerance and performance and adapt programs accordingly. Effective collaboration with healthcare providers is important to ensure that exercise plans are safe and beneficial.

Overall, trainers who are well-versed in the symptoms, complications, and management strategies for T2D and Hypertension can play a pivotal role in improving the quality of life for individuals with these conditions. Their expertise can help trainees achieve better health outcomes through tailored sport programs, informed dietary choices and emotional support.

Chapter 3

Understanding the relation people with chronic health condition and recreational sports

(Overcoming Barriers and Finding Motivation)

Living with a chronic health condition (CHC) presents numerous challenges, not the least of which is maintaining oneself physically active. While sports and recreational activities play a vital role in general health and well-being, individuals with CHC often face unique barriers that can make participation difficult. These obstacles range from physical limitations to psychological fears and societal attitudes. Despite these challenges, many individuals with CHC find ways to engage in recreational sports, driven by both intrinsic and extrinsic motivations. This chapter aims to explore the complex relationship between chronic health conditions and recreational sports, highlighting the benefits, barriers, and motivational factors.

Benefits of recreational sports for people with CHC

Engaging in recreational sports offers numerous benefits for individuals with chronic health conditions. These benefits can be categorized into physical, mental and social.

- **Physical benefits**

Participating in sports can improve overall physical health, including cardiovascular fitness, muscle strength, and flexibility. Regular physical activity can help manage symptoms of CHC, reduce pain and fatigue, and improve mobility. For example, activities such as walking football and walking basketball provide gentle exercise that can be tailored to an individual's abilities, making them ideal for those with physical limitations.

- **Mental benefits**

Recreational sports also have significant mental health benefits. Physical activity has been shown to reduce symptoms of depression and anxiety, improve mood, and boost self-esteem. The sense of accomplishment from participating in sports can enhance confidence and provide a positive outlook. Additionally, engaging in sports can serve as a distraction from chronic pain and other symptoms, offering a form of mental respite.

- **Social benefits**

Social interaction is another important benefit of recreational sports. Participating in team sports or group activities can reduce feelings of isolation and loneliness, fostering a sense

of community and belonging. This social support can be particularly valuable for individuals with CHC, as it provides emotional encouragement and shared lived experiences.

Barriers to participation in recreational sports

Despite the numerous benefits, individuals with chronic health conditions often face multiple barriers to participating in recreational sports. These barriers can be categorized into physical, psychological, and societal obstacles.

- **Physical Barriers**

Physical limitations imposed by chronic health conditions can significantly hinder participation in sports. [Pain, fatigue, and reduced mobility](#) are common physical issues that can prevent individuals from engaging in regular exercise. For some, the progression of their condition may lead to [decreased endurance and strength](#), making traditional sports activities challenging. Adaptive sports and modified activities, such as walking sports, can help mitigate these barriers by providing alternative ways to stay active.

- **Psychological Barriers**

[Fear of injury](#) or [exacerbating their condition](#) can create significant psychological barriers for individuals with CHC. Additionally, they may experience [low self-esteem](#) and [anxiety about their ability to perform](#) or keep up with others. These fears can be particularly pronounced in competitive sports environments. Creating a supportive and non-competitive atmosphere, as seen in walking basketball, can help alleviate these concerns.

- **Societal Barriers**

[Societal attitudes](#) and [lack of accessibility](#) can also be barriers to participation in recreational sports. Insufficient awareness and understanding of the needs of people with CHC amongst sports facilitators and peers can lead to exclusion and lack of support. [Facilities](#) may [not be equipped to accommodate individuals](#) with physical disabilities, and there may be a [lack of programs specifically designed](#) for those with CHC. Advocacy and education are essential to fostering inclusive environments and creating opportunities for all individuals to participate in sports.

Finding motivation

Many individuals with chronic health conditions find motivation to participate in recreational sports. The driving factors can be both intrinsic and extrinsic.

Intrinsic motivation refers to engaging in an activity for its inherent satisfaction and personal rewards. For individuals with CHC, intrinsic motivation might include the enjoyment of the sport, the challenge it presents, or the sense of accomplishment it

provides. Personal goals, such as improving fitness or managing symptoms, can also be strong motivators.

Extrinsic motivation involves external rewards or factors that encourage participation. These can include social support from friends and family, recognition and encouragement from peers, or the structured environment provided by organized programs. For some, the extrinsic motivation of seeing improvements in their health and well-being can drive continued participation.

Overcoming barriers

Developing adaptive sport programs that cater to the needs of individuals with CHC providing alternative ways to be active. Modified rules, equipment, and activities will help mitigate physical limitations and create inclusive environments. MoveUP project is an example on how adapted sports may sustain CHC people participation in sport.

Educating sports facilitators, coaches and peers about the needs and abilities of individuals with CHC is vital to fostering inclusive environments. Increased awareness can lead to sustained support, encouragement and accommodation.

Building support networks within sports programs can provide emotional and social encouragement. Peer support groups and mentorship programs can help individuals with CHC feel more confident and motivated to participate. In recent years, there has been a growing awareness of the benefits of physical activity for individuals with chronic illnesses, but challenges remain.

Ensuring that **sports facilities are accessible** to individuals with physical disabilities is essential. This includes providing safeguarding/ equipment, modifying spaces, educating staff on rapid intervention on CHC events. The societal background influences the availability and accessibility of recreational sports for people with CHC.

Government **policies and healthcare initiatives** that recognize the importance of physical activity for people with CHC are more sensitive. Funding, resources, and legislative support can improve access and participation rates. Efforts are being made to promote inclusive sports that cater to the diverse needs of individuals with CHC.

Summarizing pros and cons of practicing adapted sports

Pros

- Improves physical fitness and overall health.
- Helps manage symptoms and reduces the progression of chronic illnesses.
- Boosts mental health by reducing stress, anxiety, and depression.

- Enhances social interaction and reduces feelings of isolation.
- Encourages a sense of accomplishment and self-worth.

Cons

- Risk of injury or exacerbation of health conditions.
- May require specialized safeguarding equipment, which can be costly.
- Limited availability of programs tailored to individuals with CHC.
- Variable levels of support and understanding from society and peers.

Understanding the relationship between people with chronic health conditions and recreational sports highlights the importance of creating supportive, inclusive, and accessible sports environments. Overcoming barriers requires both individual determination and societal efforts to ensure that everyone can experience the benefits of physical activity. By addressing these factors, MoveUp project is thought to improve the quality of life for individuals with CHC through the power of recreational adapted sports.

Chapter 4

Understanding adapted sports for CHC people

Adapted sports refer to modified physical activities specifically designed to meet the needs and capabilities of individuals with chronic health conditions (CHC) and not only. These sports are tailored to enhance participation, safety, and enjoyment while accommodating various physical limitations and health concerns.

The **primary aim of adapted sports is to enable individuals with CHC to engage in regular physical activity**, which is important for managing their symptoms and improving overall health. By modifying the rules, equipment, or the intensity of traditional sports, adapted sports provide a more inclusive environment where everyone can participate and benefit.

For example, walking football and walking basketball are innovative adaptations of their respective sports. These activities maintain the fundamental aspects of the games but reduce the intensity and impact by focusing on walking instead of running. This approach lowers the risk of injury and makes sports accessible to individuals with limited mobility or endurance. Similarly, catchball, a variant of volleyball, emphasizes teamwork and coordination while being gentle on the joints and effort, making it suitable for those with or reduced physical capacity.

By focusing on adapted sports, **trainers can help individuals with CHC enjoy the benefits of physical activity**, such as improved cardiovascular health, lower blood glucose levels, enhanced mood, and increased social interaction. These activities not only promote physical well-being but also contribute to mental and emotional health, making them a valuable component of a comprehensive management plan for chronic health conditions.

The quality of lives of people with chronic health conditions (CHC) can greatly improve by practicing adapted sports. For people living with diabetes and hypertension, engaging in modified sports such as walking football, walking basketball, and catchball can be particularly beneficial. These activities provide a safe and effective way to stay physically active, manage symptoms, and maintain overall health.

Walking football and walking basketball adapt traditional sports by reducing the intensity and impact, making them suitable for individuals with limited mobility or endurance. These sports focus on walking instead of running, which lowers the risk of injury and strain. Catchball is an excellent option as it emphasizes teamwork and coordination while being gentle on the joints and effort.

Walking football in brief

Walking Football is a small-sided, low-impact, modified version of the game, suitable for all levels of ability and fitness, from people who are returning to sport after a break or those who've never played before.



Walking football is played at walking pace, with **players not allowed to run**. This includes with the ball or off the ball, and includes jogging. You can 'walk' as fast as you want and walking as described in the rules is "one foot must be in contact with the ground at all times". **The player can bring the ball back into play by passing or dribbling**. The ball does need to be stationary. This applies to both when a player is offside or when the ball goes out of play. The ball can only be brought back into play with a pass in case of a corner kick.

One area of particular emphasis in Walking Football, which is contrary to that of the conventional game, is to **pass the ball to a player**, not for them to move onto, as we usually

teach in the mainstream 11 a side game, as they are unable to run at any level. To be honest, a lot of players, who are new to the game, find this the most difficult thing to get to grips with, as they are used to playing the ball into the movement of the receiving player, rather than straight to their feet.

Three touch rule - **An outfield player is limited to three touches of the ball uninterrupted by another player touching the ball**. A fourth touch will be an infringement and result in

the award of an indirect free kick. A player having used three touches should step back two meters from the ball and not obstruct play.

More on walking football rules and regulations in ***MoveUp Manual of Walking Football***.

Walking basketball in brief

Walking Basketball was introduced as **a means to provide an alternative program that allowed adults & seniors to play basketball as a form of gentle exercise**. It allows people to stay involved in the sport they may have been away from for some time, or to try a new sport altogether, and learn new skills.



The only rule to the game is simply, **no running!** All abilities and ages are welcome. Walking Basketball is a fun, safe and social way to get your exercise in.

Whilst Walking Basketball is for everyone, studies have found that groups benefiting particularly well from this sport are

- people over 40s, 50s, 60s+ looking to maintain a good level of fitness;
- obese adults, adults with health conditions, inactive adults (men and women);
- people of all ages in the process of rehabilitation.

More on walking basketball rules and regulations in ***MoveUp Manual of Walking Basketball***.

Catchball in brief

Catchball is a new and relaxing team sport that combines elements of volleyball and handball, mostly dedicated to female players. It is characterized by continuous play, easy transitions, and constant involvement of all players. Catchball is played by two women teams on a court divided by a net. The object of the game is to send the ball over the net so that it hits the ground on the opponent's side of the court, and to prevent the ball from hitting

the ground on your side of the court. Each team **has up to three contacts** with the ball before returning it over the net.



In catchball, **contact with the ball is by catching and throwing**. Hitting the ball is forbidden. The ball is put in play with a serve: a throw from behind the end line by the server that must pass over the net into the playing space of the opponents' side of the court. A rally continues until the ball hits the ground either in the court or out-of-bounds, or a team fails to return the ball properly within three contacts. The

team that wins a rally scores a point (Rally Point System). When the team receiving the serve wins a rally, it gains both a point and the right to serve, and the players of that team rotate one position clockwise.

More on catchball rules and regulations in ***MoveUp Manual of Catchball***.

Chapter 5

Training for people living with CHC

Pre-training Assessment

Implementing adapted sports requires careful consideration of the participants' health conditions and physical abilities. This is the reason why MoveUp project trainers and coaches will collaborate with healthcare providers to ensure that the exercise programs are safe and effective. This collaboration involves:

- **Medical Clearance:** Ensuring participants have medical clearance from a healthcare professional before starting any exercise program.
- **Health History:** Gathering detailed health history, including current medications, previous injuries, and any limitations.
- **Fitness Level:** Assessing the initial fitness level to tailor the program accordingly.

For example: people living with diabetes starting an exercise program should be reviewed by medical personnel, to gather relevant information. This includes:

- a. Diabetes type;
- b. Medication regimen including any recent changes (does it include insulin or sulfonylureas);
- c. Other relevant clinical data (e.g. fasting glucose level, blood pressure, heart rate, oxygen saturation);
- d. Co-morbidities if any (See Table 1);
- e. Factors that may specifically impact exercise program participation.

The table below outlines some instances when further investigations or specific physical activity prescription are required by a healthcare professional.

Presenting Condition	Recommendation
Diabetes-related eye conditions (proliferative retinopathy and vitreous haemorrhage)	Visit eye specialist before starting new activities
Autonomic neuropathy	Visit diabetes specialist for further physical activity advice
Recent chest pain, high blood pressure and or high cholesterol that has not been investigated or treated	Visit doctor for more investigations before starting activity
<i>Can commence activity but with specific considerations</i>	
Coronary artery disease (over 65 years of age or are considered 'high risk' of adverse cardiac events as determined by SCORE2 risk stratification)*	Further medical assessment is required for high intensity or vigorous physical activity and some forms of resistance training

https://www.heartscore.org/en_GB/heartscore-europe-risk-regions	
Angina (a type of chest pain and symptom of coronary artery disease)	Be active at a level and intensity that does not induce angina symptoms
Recent heart attack	Supervised activity at an outpatient cardiac rehabilitation facility is recommended for 3-6 months before sports participation can be considered
Heart failure, valvular disease, aortopathy, cardiomyopathy, arrhythmias, congenital heart disease	May require physical activity guidance by the treating healthcare professional
Diabetes managed with either sulfonylurea medication or insulin	The person may be at greater risk of hypoglycaemia with some forms of activity. Blood glucose monitoring recommended – see below
New or unaccustomed to physical activity	Slow and gradual progression of physical activity frequency, intensity and duration is recommended to reduce the risk of musculoskeletal injury
Active Charcot foot and or limb amputations	Activity or sport adaptation may be required, along with assistive devices

**In general, if the person reports high cholesterol, high blood pressure, is over the age of 65 year and or smokes, using the SCORE2 risk stratification or referring to their physician is recommended before commencing high intensity or vigorous physical activity and some forms of resistance training.*

Table 1. Physical Activity Considerations^{1,2}

Healthcare professionals should balance the above information when considering an individual's suitability to physical exercise and sport.

For more details on the subject, see Appendix 4 *Type 2 Diabetes Exercise Action Plan*.

Strategies for Effective Training

Effective training strategies for individuals with CHC include:

- **Incorporating a variety of exercises** that target different muscle groups and improve overall fitness, such as aerobic exercises, strength training, and flexibility exercises.
- **Using adaptive equipment and techniques** to accommodate the individual's physical limitations and enhance their exercise experience.

¹ Pelliccia A, Sharma S, Gati S, Bäck M, Börjesson M, Caselli S, et al. 2020 ESC Guidelines on sports cardiology and exercise in patients with cardiovascular disease: The Task Force on sports cardiology and exercise in patients with cardiovascular disease of the European Society of Cardiology (ESC). *European Heart Journal*. 2020;42(1):17-96.

² Colberg SR, Sigal RJ, Yardley JE, Riddell MC, Dunstan DW, Dempsey PC, et al. Physical Activity/Exercise and Diabetes: A Position Statement of the American Diabetes Association. *Diabetes Care*. 2016;39(11):2065-79.

- **Implementing gradual progression** in exercise intensity and complexity to prevent overexertion and injury.
- **Encouraging self-monitoring** and self-management of health conditions through the use of health tracking apps and devices.
- **Collaborating with healthcare professionals** to ensure a holistic approach to the individual's health and well-being.
- **Providing education** on the importance of regular physical activity and its benefits in managing CHC.

Training Principles in relation with CHC persons

1. Individualization

MoveUp project proposes to tailor the sport program to each individual's needs, considering their health conditions, fitness levels, and personal goals.

For individuals with T2D or hypertension, **it is crucial to consider their specific medical needs and limitations**. Tailoring a sport program for these individuals involves several key aspects:

- **Health Condition:** Understanding the individual's health condition is paramount. For those with T2D, the program should aim to manage blood glucose levels through regular physical activity, which enhances insulin sensitivity. For individuals with hypertension, the focus should be on exercises that help lower blood pressure and improve cardiovascular health.

- **Fitness Level:** Once the individual's current fitness level has been assessed, the trainer will be able to design a program that is both challenging and achievable. For someone with T2D, starting with low to moderate-intensity exercises like brisk walking can be beneficial. Gradually increasing intensity helps improve their fitness without causing undue stress. For those with hypertension, it is critical to avoid extremely high-intensity workouts that might spike blood pressure.

- **Personal Goals:** Each individual's personal goals should be considered to keep them motivated and engaged. Whether the goal is weight loss, improved cardiovascular health, or blood glucose management, the program should be designed to align with these objectives.

2. Progression

Progression is a fundamental principle in exercise training, **Gradually increasing the intensity and duration of physical activities** ensures that individuals can safely improve their fitness levels and achieve their health goals without risking overexertion or injury.

For people living with **T2D**, progression should be carefully managed to optimize the benefits of physical activity on blood glucose management. Starting with low-moderate intensity* physical activity helps the body adapt to regular movement. Over time, the intensity can be incrementally increased by incorporating more vigorous activities** or resistance exercises. Keep monitoring blood glucose levels before, during, and after exercise to prevent hypoglycemia and adjust the activity as needed.

For those with **hypertension**, the focus should be on activities that enhance cardiovascular health while avoiding sudden spikes in blood pressure. Beginning with moderate-intensity* physical activity, such as walking or swimming, allows the cardiovascular system to gradually adapt. The duration of these activities can be extended over time, and the intensity can be increased to include more sustained activities. Regular monitoring of blood pressure is mandatory to ensure that the exercise intensity remains within safe limits.

** **Moderate intensity** activity feels ‘somewhat hard’. The person’s breath increases but not to a point of being out of breath. They may start to sweat after 10 minutes of activity and the person is still able to maintain a conversation at this intensity but would not be able to sing or whistle.*

*** **Vigorous intensity** activity feels ‘hard’. The person’s breath is deep and rapid. They may begin to sweat after a few minutes and they are unable to maintain a conversation without pausing for breath.*

Key strategies for progression include:

- **Consistency:** Maintaining a regular exercise schedule helps the body adapt and become more resilient over time.
- **Incremental Increase:** Gradually increasing the duration and intensity of workouts allows the body to build strength and endurance without overloading it.
- **Variety:** Incorporating different types of exercises, such as aerobic, strength training, and flexibility exercises, ensures a well-rounded sport program and prevents burnout.

3. Monitoring

Regular **monitoring of health markers** such as blood pressure and blood glucose levels is critical to ensure safety during sport activities. This practice helps in identifying any potential risks early on and allows for timely interventions to prevent complications.

Physical activity can affect blood glucose levels in different ways depending on the frequency, intensity, type and duration of the activity. Glucose levels can go up, down or remain stable during/after activity and often each person will experience something slightly different. Monitoring glucose levels before, during and after activity can be a good way for someone to find out how their glucose levels change with different forms of activity. Monitoring and learning how the body responds to activity is a good way to plan management strategies for future activity depending on the goals of the individual.

blood glucose level In case of hypertension, monitoring blood pressure before, during, and after exercise sessions is equally important. **Sudden spikes in blood pressure can occur with intense physical activity**, posing risks to cardiovascular health. Regular checks ensure that exercise intensity remains within safe limits and helps in modifying the regimen to match the participant's current health status. This will also promote gradual adaptation.

Additionally, the **use of wearable technology** and **regular health checks** can provide continuous monitoring and instant feedback. Devices such as heart rate monitors, smartwatches and glucose meters can offer real-time data, enabling participants and trainers to make informed decisions about their exercise routines.

Overall, integrating regular health monitoring into exercise programs not only enhances safety but also empowers participants to manage their health proactively. This practice fosters a supportive environment where individuals can pursue their sport goals with confidence, knowing their well-being is consistently being safeguarded.

As a general rule, trainings should be of one hour duration, with low impact cardio training, having lots of breaks during the session and lots of fun. Their purpose will be to teach participants new skills, but will also represent a place to meet new people in a stress-free environment. Trainings are accessible for men and women and finally an opportunity to play matches against other Adapted Sports Clubs.

Step-by-step training for walking football

Step 1: Building a Foundation

First step we suggest within the project, in order to train for Walking Football, is to practice walking, not only on a speed basis (no running!), but also working on distance and resistance. A simple walk on a regular basis will help and is easily accessible, in most areas of the cities.

Step 2: Gradual Intensity Increase

Second step of the training should be low-intensity activities, gradually increasing in duration and intensity as fitness levels improve. Walking football sessions should be adapted to the individual's capabilities, with regular breaks to avoid overexertion. Monitoring the individual's response to exercise is essential, with an emphasize in the first stages of enrolment, ensuring that any signs of discomfort or distress are promptly addressed.

Step 3: Skill-Building Exercises

Third step involves incorporating skill-building exercises specific to walking football. These exercises should focus on enhancing coordination, balance, and ball control. Participants will engage in activities such as passing drills, shield drills and shooting practice, all performed at a walking pace. Emphasis should be placed on mastering techniques that will be used during matches, ensuring participants feel confident in their abilities. Furthermore, teamwork and communication exercises can be included to foster a sense of camaraderie and improve on-field dynamics.

Appendix 1 is a proposed 4 week plan as **Step 4 Acquiring specific skills in walking football**. In one hour duration, sessions led by our certified trainers include: warm up, skills development exercises, playing a game, stretch/cool-down.

Step-by-step training for walking basketball

Step 1: Building a Foundation

The first step in training for walking basketball involves practicing walking at a steady pace to build endurance and stamina. Focus on walking regularly, gradually increasing the distance covered. This helps to improve cardiovascular health and is easily accessible in most urban areas.

Step 2: Gradual Intensity Increase

The second step consists of low-intensity activities, such as gentle stretching and light exercises. As fitness levels improve, gradually increase both the duration and intensity of these activities. Ensure that walking basketball sessions are tailored to the individual's capabilities, incorporating regular breaks to prevent overexertion. Monitoring the individual's response to exercise is essential to address any signs of discomfort or distress promptly.

Step 3: Skill-Building Exercises

Incorporate skill-building exercises specific to walking basketball. These exercises should enhance coordination, balance, and ball control. Participants will engage in activities such as passing drills, shooting practice, and defensive maneuvers, all performed at a walking pace. Emphasis should be placed on mastering techniques to boost confidence during matches. Teamwork and communication will foster camaraderie and improve on-court dynamics.

Appendix 2 is a proposed 4 week plan as **Step 4 Acquiring specific skills in walking basketball**.

Step-by-step training for catchball

Step 1: Building a Foundation

The initial phase of training for catchball involves developing a solid foundation of basic physical fitness and familiarity with the sport. Gentle stretching and light exercises will help participants to build flexibility and ensure they are ready for more specific catchball activities.

Step 2: Gradual Intensity Increase

As participants' fitness levels improve, gradually introduce low-intensity catchball-specific exercises. Incorporate gentle movements such as passing and catching the ball, performed at low intensity. Gradually increase the duration and intensity of these exercises, ensuring they match the individual's capabilities. Regular monitoring is essential to adjust the training plan according to the participant's response and to prevent overexertion.

Step 3: Skill-Building Exercises

Focus on skill-building exercises specific to catchball. These exercises should enhance coordination, balance, and ball control. Introduce serve, then attack and defensive maneuvers at the net, all performed at low intensity, then normal intensity. Emphasis should be placed on mastering techniques and collaboration between players. Teamwork and communication exercises foster a sense of camaraderie and improve on-court dynamics.

Appendix 3 is a proposed 4 week plan as **Step 4 Acquiring specific skills in catchball.**

Complementary exercises recommendations

Aerobic exercise

Engage in moderate-intensity aerobic exercises like walking, cycling, or swimming for at least 150 minutes per week. These exercises help improve cardiovascular health and manage blood glucose levels. Fitness is crucial in any type of football, and this includes Walking Football; particularly as a crucial part of the game is to be able to get into a position in which to influence the game on behalf of your team. This can be while attacking or defending. So, as a result of this, we suggest that, in order to train for Walking Football / Walking Basketball, it is important that players practice walking, not only on a speed basis (but no running!), but also working on distance and stamina.

Strength training

Incorporate strength training exercises twice a week to enhance muscle mass, metabolic rate, and overall physical function. Focus on major muscle groups and ensure proper form to prevent injuries. Coaches are not expecting people to be “exceptional” in terms of fitness levels, just fit enough to be able to move into a position to receive a pass in the game, to be able to help their team mates.

Flexibility and balance

Include stretching and balance exercises in the morning to improve flexibility and reduce the risk of falls, which is vital for individuals with CHC. Flexibility and balance exercises are even more important for older adults with diabetes. Limited joint mobility is frequently present, resulting in part from the formation of advanced glycation end products, which accumulate during normal aging and are accelerated by hyperglycemia.

Stretching increases range of motion around joints and flexibility but does not affect glycemic control. Balance training can reduce falls risk by improving balance and gait, even when peripheral neuropathy is present. Group exercise interventions (resistance and balance training, tai chi classes) may reduce falls by 28%-29%.³

Communication

It is vital, especially in Walking Football but not only, that **players are able to not only call for the ball, but also to talk to teammates**, in order to explain where the ball is going, so that they are ready to receive it. This sounds obvious, but many football pitches and games, are too quiet and calling for the ball helps your team mates, especially as controlling the ball is difficult for many CHC players. Simple shouts like “man on”, or “time”, help enormously and we’ve been doing that, as footballers of all levels. Communicating (instructing and shouting) are not “putting your team mates down” but actually helping them and the team.

Participant Recruitment

Although physical activity is routinely recommended for this population, it can be difficult to engage people living with T2D and hypertension/CVD for various reasons including stigma associated with the condition and the person’s age.

Some methods to reach participants may include:

- Promoting the activity through diabetes related associations, specifically patient associations.
- Contacting local diabetes health professionals, including diabetologists, endocrinologists, cardiologists, diabetes nurses and general practitioners and

³³ Sheri R. Colberg et al. - Physical Activity/Exercise and Diabetes: A Position Statement of the American Diabetes Association, in *Diabetes Care* Volume 39, November 2016

provide information material that they can share with people living with CHC in their care.

- Using existing communication channels that are frequently used by people living with T2D and/or CHC. Facebook attracts an older audience than most other social media and many national diabetes groups and peer-to-peer support groups are active on this platform.
- If focus groups are run, participants could be asked to spread the word about the project and help recruit their peers.
- Focus promotional material on the social and fun aspects of the programme, using words like “fun”, “connection”, “friendships”, as this has proved successful in recruitment efforts in similar fields. If possible, including testimonials with this focus can also help attract players.
- Making an announcement and offering a demonstration of adapted sports at local football, basketball and catchball games.

Chapter 6

Safety considerations for trainers

Guidelines for Safe Training

Trainers must follow specific guidelines to ensure the safety of individuals with CHC during exercise sessions. These measures include:

- Conducting thorough [pre-exercise assessments](#) to identify any potential risks or contraindications.
- [Monitoring vital signs](#) such as blood pressure and blood glucose levels before, during, and after exercise.
- [Ensuring proper hydration and nutrition](#) to prevent hypoglycemia and other complications. Ensure participants remain hydrated, especially during prolonged exercise sessions.
- [Modifying exercise intensity and duration based on the individual's fitness level](#), medical history, and current health status.
- [Providing clear instructions and demonstrations](#) to ensure correct exercise technique and posture.
- [Creating a supportive and encouraging environment](#) that motivates individuals to stay active and adhere to their exercise regimen.
- [Paying attention to warm-up and cool-down](#): Incorporate adequate warm-up and cool-down periods to prepare the body for exercise and aid recovery.
- [Being vigilant for any signs of distress](#), such as dizziness, shortness of breath, or chest pain and know how to respond appropriately.
- [Building an emergency plan always in place](#) and ensure all complementary staff are trained in basic first aid and CPR.

Signs and symptoms of hypoglycemia and hyperglycemia⁴

Parents, friends, coaches, athletic trainers, sports nutritionists, and sports team members should know the typical signs of hypo and hyperglycemia. Unfortunately, many of these signs and symptoms are similar to typical responses to physical exertion when playing sports.

Hypoglycemia refers to abnormally low BGLs, typically **below 70 mg/dL** (3.9 mmol/L). Common causes include excessive insulin administration, missed meals or **physical**

⁴ Peter A. Farrell - Diabetes, Exercise and Competitive Sports, in *Sports Science Exchange*, Volume 16 (2003) _number 3

activity. Symptoms range from shakiness, dizziness, weakness, blurred vision and sweating to confusion and, in severe cases, loss of consciousness.

What to do in case of a hypoglycaemic event?

The standard management protocol for hypoglycaemia (BGL less than 72 mg/dl / 4 mmol/L):

1. Stop activity
2. The person immediately consumes 15g of fast-acting carbohydrates (such as glucose tablets, juice or sugary snacks)
3. Wait 15 minutes and rest
4. Re-check BGL with finger prick
5. If still below 72 mg/dl (4 mmol/L), consume another 15g of fast-acting carbohydrates
6. Repeat steps 2-5 until BGLs rise above 72 mg/dl (4 mmol/L)
7. Once above 72 mg/dl (4 mmol/L), the person may choose to consume 15g of complex carbohydrates (e.g., a small snack like a muesli bar or bread) to help maintain BGLs.

******If the person loses consciousness, becomes unresponsive, or is unable to swallow, emergency assistance should be sought immediately. Do not put anything in their mouth ******

Hyperglycaemia (hyper)

Hyperglycaemia refers to high BGLs. It is common for BGLs to fluctuate above target range for someone living with diabetes and may be caused by stress, illness, inadequate insulin or diabetes medication, food, certain medications like steroids and or physical activity. A small rise in BGLs during activity is not usually a problem and in fact, light to moderate intensity activity can help bring BGLs down. If BGLs rise above 268 mg/dL (14.9 mmol/L) or if the person is feeling unwell, some action may be required.

In case of a hyper (above 268mg/dL or above 14.9 mmol/L):

1. Stop the activity
2. Provide water to the person
3. Check BGLs (and ketones for those living with T1D, if at all possible). The person might need to take insulin if prescribed.
4. Monitor the person and with any signs of nausea, vomiting or stomach cramps seek urgent medical assistance

Signs and symptoms of high and low blood pressure⁵

The symptoms of hypertension and hypotension can vary significantly. These symptoms can occur suddenly. They may also vary in intensity depending on why a person's blood pressure drops and how quickly it happens.

- **Symptoms of hypertension:** In some cases, people with very high blood pressure — measuring 180/120 mm Hg or higher may experience: headaches, shortness of breath, nosebleeds, flushing, dizziness, chest pain, visual changes, blood in the urine. However, these symptoms are nonspecific and usually do not occur until high blood pressure has reached a severe or life threatening stage.
- **Symptoms of hypotension:** Symptoms of hypotension can happen because the brain and other parts of the body are not getting enough blood. Symptoms can include: dizziness or light headedness, fainting (syncope), blurred vision, nausea, fatigue, changes in mental status, cold, clammy, pale skin, shallow breathing, increased thirst compared to usual.

Chest pain, shortness of breath, light headedness

In the case of chest pain, shortness of breath (inconsistent with the person's usual response to activity) and light headedness:

1. Stop the activity
2. Sit or lay the person down
3. Call for medical assistance
4. Locate an Automated External Defibrillator (AED)*
5. Follow first aid procedures**

*Where possible, it is recommended that an AED is available at the venue and that staff/trainers know where it is located

**It is recommended trainers attend general first aid and resuscitation training

If the person has known stable angina, it is recommended they carry their prescribed nitroglycerin sublingual (under the tongue) spray. In the case of angina symptoms, it is recommended the person use their nitroglycerin as prescribed.

Syncope (fainting) or recurrent light headedness

Some medications used in treating CVD may cause blood pressure to drop or the heartbeat to be too slow. This can happen particularly when people change positions, for example from sitting to standing. People may need to avoid rapid changes in posture and or may need to speak to their healthcare professional to make sure the medication dose is correct.

⁵ <https://www.medicalnewstoday.com/articles/hypertension-vs-hypotension>

Behavioral strategies for trainers

Motivation and Support: Trainers should provide continuous motivation and support to encourage adherence to the exercise program. Positive reinforcement and setting achievable goals can be very effective. Create an open dialogue about diabetes: your players will be used to talking about diabetes as they are living with it every day. Help them feel comfortable to discuss it openly and they will let you know if they need any support. This will also help better your understanding of what it's like to live day to day with diabetes and how to support your players best.

Education: educate participants about their conditions, the benefits of exercise, and how to self-monitor their health. Also educate the team: discussing diabetes openly with your team can help them better understand that diabetes is a serious topic. Your team will feel more comfortable with asking questions and knowing how to help their teammate should they need it when the time comes. By providing education to your team and creating a safe environment to discuss diabetes openly, you can break the stigma that players with diabetes cannot perform to their full potential.

Creating safe environments: Providing safe, hygienic places for your player to administer injections or make adjustments to their wearable technology will help their pre match and pre training routine (toilets are not considered a hygienic place for this scenario). Having fast acting glucose (hypo treatment) to hand in medical bags, changing rooms etc will also make your player feel more accepted and safe. If you're going to adapt your sessions from time to time, inform the players whether it will be lighter or more intense, as it can help to their preparation.

Conclusion

Training people living with T2D and hypertension in recreational sports requires a comprehensive understanding of their conditions and thoughtful planning. By following the guidelines and recommendations in this manual, trainers can provide safe, effective, and enjoyable exercise programs that enhance the health and well-being of participants.

Resources

References:

- European Association for the Study of Diabetes: [<https://www.easd.org/>]
- European Heart Association: [<https://www.heartassociation.eu/>]
- Centers for Disease Control and Prevention: [<https://www.cdc.gov/>]
- Diabetes UK [www.diabetes.org.uk]: Search for 'exercise'

Additional resources

<https://www.diabetes.org.uk/guide-to-diabetes/managing-your-diabetes/exercise>

<https://jdrf.org.uk/exercise-type-1-diabetes/>

<https://jdrf.org.uk/stories/experts-guide-exercising-type-1-diabetes/>

<https://thediabetesfootballcommunity.com>

Appendix 1: A 4-WEEK TRAINING PLAN IN WALKING FOOTBALL

An effective training plan is crucial for engaging people with CHC. A well-structured training program not only enhances players' skills but also fosters team cohesion and a winning mentality. This comprehensive plan includes a mix of technical, tactical, physical, and mental training components.

WEEK 1 TRAININGS

Week 1 might focus on laying the foundations, including ball control, passing, and dribbling techniques, as well as introducing basic tactical concepts such as positioning. Trainers can include strength exercises for the entire body, based on participants individual health conditions, to build a solid physical foundation.

Training No.	Technical Training	Tactical Training	Small-Sided Games	Shooting Practice
1	Ball Familiarisation and Dribbling	Introduction to Basic Passing & Receiving	4v4 or 5v5 with Focus on Possession	Finishing Drills
2	Dribbling Drills	Basic Defending and Introduction to Shooting	3v3 or 4v4 with Focus on Dribling	Shooting Techniques
3	Passing & Receiving Drills	Passing Accuracy & Team Play	4v4 or 5v5 small-sided games with Focus on Defensive	Advanced Shooting Drills

Training 1: First Contact

Warm-up (15 minutes):

- Light jogging and dynamic stretches.
- Dynamic movements like high knees, butt kicks, leg swings, and side shuffles.

Ball Familiarization and Dribbling Drills (30 minutes):

- Introduction to the ball: Players practice basic ball touches with both feet (inside, outside, sole).
- Dribbling through cones: Players navigate through a series of cones with the ball, incorporating turns and direction changes.

Passing and Receiving Drills (25 minutes):

- Weighted passing: Players work on adjusting the weight of their passes based on the receiver's position.
- Moving receiving: Players practice moving to receive the ball from different angles.

Small-Sided Games (30 minutes):

- Play 4v4 or 5v5 small-sided games to focus on dribbling, passing, and teamwork.

Training 2: Developing Skills

Defensive Skills (30 minutes):

- Jockeying: Players practice jockeying and staying between the attacker and the goal.
- Basic tackling technique: Introduction to tackling with an emphasis on safety and fair play.

Small-Sided Games (40 minutes):

- Play 4v4 or 5v5 small-sided games to incorporate defending skills in game situations.

Shooting Technique (30 minutes):

- One-on-one shooting: Players take turns as shooters and goalkeepers in a one-on-one scenario.

Training 3: Understanding the Game

Offensive Tactics (30 minutes):

- Introduction to attacking formations: Players learn basic principles of attacking formations and movements.
- Overlapping runs: Players practice overlapping runs to create width and space during attacks.

Small-Sided Games (40 minutes):

- Play 4v4 or 5v5 small-sided games with an emphasis on offensive and defensive tactics.

Shooting Practice (30 minutes):

- Finishing drills: Players practice shooting and finishing inside the box.

WEEK 2 TRAININGS

In **Week 2**, the emphasis shifts towards passing and shooting. Drills are incorporated to enhance players' quickness and precision. Advanced passing and dribbling techniques are practiced at higher speeds, and tactical aspects such as wing attacks and counter-attacks are explored. Plyometric exercises could be introduced to improve power and strength.

Training No.	Technical Training	Tactical Training	Small-Sided Games	Shooting Practice
1	Ball Familiarization and Dribbling	Basic Defending and Introduction to Tackling	5v5 small-sided games with focus on attacks	One-on-one Shooting
2	Dribbling Drills	Offensive Team Play	4v4 or 5v5 small-sided games with focus on tactics	Target Shooting with Accuracy
3	Passing & Receiving Drills	Shooting Practice	4v4 or 5v5 small-sided games with focus on defense	Finishing Drills

Training 1: Working on Skills

Warm-up (15 minutes)

Speed and Agility Drills (30 minutes):

- Set up ladder drills, cone drills to improve players' precision, footwork, and agility.
- Focus on quick changes of direction to enhance on-field movements.

Advanced Passing Techniques (25 minutes):

- Progress to passing exercises, introducing lofted passes, driven passes, and bending passes.
- Emphasize accuracy, weight of the pass, and increasing passing speed in various scenarios.

Tactical Wing Attacks (30 minutes):

- Teach players how to initiate and execute wing attacks effectively.
- Emphasize overlapping stepping, switching play and creating attacks to flanks.

Plyometric Exercises (25 minutes):

- Incorporate plyometric and exercises to develop explosive power.

Training 2: Advanced Theory and Technique

Warm-up (15 minutes):

Dribbling (30 minutes):

- Encourage players to dribble while maintaining control and close ball control.
- Focus on quick changes of direction while dribbling.

Introduction to Counter-Attacks (25 minutes):

- Teach players how to quickly transition from defense to offense
- Emphasize quick ball movement and exploiting space to catch opponents off-guard.

Advanced Dribbling Techniques (30 minutes):

- Work on moves like step-overs, feints, and cuts to beat opponents.
- Practice dribbling in 1v1 and 2v2 situations with increased intensity and decision-making.

Strength Training (25 minutes):

- Implement exercises like squats to build strength.
- Focus on power in plyometric exercises to enhance movements.

Training 3: Fast and Furious

Warm-up (15 minutes)

Sprints and Quick Direction Changes (30 minutes):

- Set up drills with variations in distance and intensity.
- Incorporate cone drills for quick changes of direction to simulate game scenarios.

One-Touch Passing and Receiving (25 minutes):

- Practice quick and accurate one-touch passing and receiving to improve players' speed of play.
- Emphasize fast decision-making and efficient ball circulation.

Defensive Positioning and Pressing (30 minutes):

- Teach players how to maintain defensive shape and press opponents effectively.
- Work on shifting as a unit, marking opponents, and pressing in specific zones.

Jumping Drills (25 minutes):

- Include small vertical jump exercises to improve players' leaping ability.

WEEK 3 TRAININGS

Week 3 concentrates on the development of defense and offense positioning.

Training No.	Technical Training	Tactical Training	Small-Sided Games	Shooting Practice
1	Ball Control and Turning	Defensive Shape and Compactness	4v4 or 5v5 with Focus on Possession	Finishing Drills
2	Passing Under Pressure	Transition from Defense to Attack	3v3 or 4v4 with Focus on Attacks	Shooting Techniques
3	Dribbling in Crowded Areas	Offensive Positioning and Movement	5v5 with Focus on Defensive Pressure	Advanced Shooting Drills

Training 1 Flexibility and Tactics

Warm-up (15 minutes)

Agility Drills (30 minutes):

Advanced Passing Techniques (25 minutes):

- Progress to passing exercises, introducing lofted passes, driven passes, and bending passes.
- Emphasize accuracy, weight of the pass, and increasing passing speed in various scenarios.

Tactical Wing Attacks (30 minutes):

- Teach players how to initiate and execute wing attacks effectively.
- Emphasize overlapping steps, switching play, and creating width in attacks to exploit the flanks.

Plyometric Exercises (25 minutes):

- Incorporate plyometric exercises to develop power.

Training 2 Playing at high speed

Warm-up (15 minutes):

Dribbling at Higher Speed (30 minutes):

- Encourage players to dribble at a faster pace while maintaining control and close ball control.
- Focus on quick changes of direction while dribbling.

Introduction to Counter-Attacks (25 minutes):

- Teach players how to quickly transition from defense to offense during counter-attacks.
- Emphasize quick ball movement and exploiting space to catch opponents off-guard.

Advanced Dribbling Techniques (30 minutes):

- Work on moves like step-overs, feints, and cuts to beat opponents.
- Practice dribbling in 1v1 and 2v2 situations with increased intensity and decision-making.

Strength Training (25 minutes):

- Implement exercises like squat jumps and box jumps to build strength.
- Focus on power and speed in plyometric exercise.

Training 3 Receiving and pressing

Warm-up (15 minutes)

Sprints and Quick Direction Changes (30 minutes):

- Set up drills with variations in distance and intensity.
- Incorporate cone drills for quick changes of direction to simulate game scenarios.

One-Touch Passing and Receiving (25 minutes):

- Practice quick and accurate one-touch passing and receiving to improve players' speed of play.
- Emphasize fast decision-making and efficient ball circulation.

Defensive Positioning and Pressing (30 minutes):

- Teach players how to maintain defensive shape and press opponents effectively.
- Work on shifting as a unit, pressing in specific zones.

Jumping Drills (25 minutes):

- Include small vertical jump exercises to improve players' leaping ability.
- Introduce jumping techniques for heading and winning aerial duels.

WEEK 4 TRAININGS

Training No.	Technical Training	Tactical Training	Small-Sided Games	Shooting Practice
1	Ball Control and Passing	Defensive Footwork Drills	4v4 or 5v5 with Focus on Possession	Finishing Drills
2	Shooting Techniques	Positional Awareness	4v4 or 5v5 with Focus on Defense	Volleys and Half-Volleys
3	Team Play	Attacking Patterns	4v4 or 5v5 with Focus on Team Play	Advanced Shooting Drills

Training 1: Ball Control and Passing

Warm-up (15 minutes)

Ball Control Drills (30 minutes):

- Cone dribbling: Players dribble through a series of cones, focusing on close ball control.
- Inside-outside passing: Players practice passing the ball with the inside and outside of their feet.

Passing and Receiving Practice (25 minutes):

- Wall passing: Players pass and receive the ball from a wall, focusing on accuracy and first touch.
- Moving triangles: Players form triangles and pass the ball while moving to improve passing and support.

Small-Sided Games (30 minutes):

- Play 4v4 or 5v5 small-sided games with a focus on using ball control and passing skills.

Training 2: Defensive Skills and Positioning

Warm-up (15 minutes)

Defensive Footwork Drills (30 minutes):

- Shuffle and slide: Players work on defensive footwork by shuffling and sliding sideways.
- Defensive shadowing: Players practice mirroring the movements of an attacker without making a tackle.

Positional Awareness (25 minutes):

- Defensive positioning: Teach players how to position themselves to block passing lanes and intercept the ball.
- Zonal marking: Players learn to mark specific zones on the field during defensive play.

Small-Sided Games (30 minutes):

- Play 4v4 or 5v5 small-sided games with a focus on defensive skills and positioning.

Training 3: Shooting and Team Play

Warm-up (15 minutes)

Shooting Techniques (30 minutes):

- Instep shooting review: Players practice shooting with the instep for accuracy and power.
- Volleys and half-volleys: Teach players how to strike the ball out of the air for volleys and half-volleys.

Team Play (25 minutes):

- Attacking patterns: Players learn specific movements and passes to create goal-scoring opportunities.

- Defensive teamwork: Teach players how to work together to defend as a unit.

Small-Sided Games (30 minutes):

- Play 4v4 or 5v5 small-sided games with a focus on using shooting and team play skills.

In this Week 4 training plan, the focus is on ball control, passing, defensive skills, shooting, and team play. The sessions are designed to build on the fundamental skills learned in previous weeks while introducing more advanced concepts in defensive positioning and team coordination. The warm-up and cool-down are essential for injury prevention and player readiness.

With this 4-week plan beginners will develop advanced skills and knowledge which are required to take part in first tournaments, e.g. tournaments during the European Week of Sports. We recommend having a few friendly games before a serious walking football match or to play in small-sided tournaments in general first in order to get to know the atmosphere before a match.

Appendix 2: A 4 WEEKS TRAINING PLAN TO TRAIN WALKING BASKETBALL PLAYERS / WB SKILLS

Walking Basketball is an adapted version of traditional basketball that eliminates running and reduces physical contact, making it accessible and safe for older adults, individuals in rehabilitation, or those new to physical activity. It retains the fundamental skills and excitement of the game—passing, shooting, positioning—while promoting health, inclusion, and enjoyment.

This 4-week training plan is structured to progressively develop fitness, balance, coordination, and basketball technique within the unique format of walking basketball. The plan encourages regular movement, teamwork, and confidence, aiming to improve both physical and social well-being.

Whether you are returning to sport or trying something new, this program is designed to be inclusive, engaging, and supportive of lifelong physical activity.

Each weekly session includes:

- Dynamic warm-ups and mobility drills
- Fundamental skill work (dribbling, passing, shooting)
- Game-based drills and tactical awareness
- Cool-down and stretching for recovery

WEEK 1: Introduction & Fundamentals (two times for week)

No.	Warm-Up (10 min)	Dribbling Drills (15 min)	Passing Practice (15 min)	Shooting Fundamentals (10 min)	Cool-Down & Stretching (10 min)
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1	Gentle walking laps, dynamic arm and leg swings, shoulder rolls.	Walk while dribbling with both hands, around cones, and in zig-zags.	Chest passes and bounce passes in pairs; walk and pass drills	Focus on form, short-range shots, and aiming at the backboard.	Static stretches: calves, quads, shoulders.
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WEEK 2: Ball Handling & Spacing (two times for week)

No.	Warm-Up (10 min)	Advanced Dribbling (15 min)	Passing on the Move (15 min)	Shooting with Movement (10 min)	Cool-Down & Stretching (10 min)
1	Walking basketball-specific movements, gentle lateral steps.	Walk-dribble with crossovers and changes of pace (no running).	Trios moving and passing in motion-focus on spacing.	Catch-and-shoot after walking toward the ball	Static stretches: calves, quads, shoulders, arms

WEEK 3: Defense & Small-Sided Games

No.	Warm-Up (10 min)	Defense Fundamentals (15 min)	Game-Based Drills (15 min)	Shooting Challenge (10 min)	Cool-Down & Stretching (10 min)
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1	Add defensive slides and walking shuffles	Positioning, arms up, lateral movement without contact	3v3 walking games focusing on passing and spacing	Spot shooting contest—fun, low-pressure	Static stretches: calves, quads, shoulders, arms, legs, pelvis
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WEEK 4: Game Simulation & Teamwork

No.	Warm-Up (10 min)	Team Strategy (10 min)	Full-Court Game (25 min)	Reflection & Cool-Down (15 min)	Cool-Down & Stretching (10 min)
1	Incorporate elements from all previous warm-ups	Teach basic offensive sets and player movement	Controlled walking basketball game with rotations and coaching tips	Spot shooting contest—fun, low-pressure	Static stretches: calves, quads, shoulders, arms, legs, pelvis

Appendix 3: A 4 WEEK TRAINING PLAN TO TRAIN CHC PEOPLE IN CATCBALL SPECIFIC SKILLS

WEEK 1 Chest throwing and catching

Objectives

1. Improve chest pass throwing
2. Improve and practice catching and throwing ball skills

Time: 1hour		Outcomes	Resources	Comments
Main Teaching	1. To perform the chest pass throwing: - participants will practice the chest pass throwing 2. Increasing ball control: - participants will practice catching and throwing the ball over the head with two hands	Understand how to push the ball with the hands Co-operate with your partner in catching the ball	10 Volleyballs 20 Cones Pitch Net	They have improved their throwing skills They have increased the ball control
Activities	1. Warm-up game: Participants will play at the same time Sound and action: • one whistle- throwing the ball from the chest • two whistles- throwing the ball over the head			5 minutes all over the volleyball court
	2. Warm-up exercises: Participants will play at the same time			
	• ankle jogging			2 times up to 3 meters
	• easy skipping			2 times 5 bouncing
	• big steps			2 times to 5 meters
	• stretching			5 minutes
	3. Development:			

	a. Practice individually:			
	• passing the ball from the chest in the air and catching with both hands			4 times
	• throwing over the head with both hands in the air and catching with both hands			4 times
	b. Practice in pairs passing: participants will practice at the same time			
	• chest pass with the partner to catch the ball by increasing the distance			4 times
	• over the head pass with the partner by increasing the distance			4 times
	c. Practice footwork, changing direction:			4 times
	• right foot to right side of the body			
	• left foot to the left side of the body			
	d. Play one short set			1 set up to 21 points
Cool-down every 20 min	Sleeping lions			3 minutes

WEEK 2 overarm throwing and passes

Objectives

1. Perform overarm throwing
2. Improve passes

Time: 1 hour		Outcomes	Resources	Comments
Main Teaching	1. To perform the overarm throwing the ball correctly: • together participants will practice the overarm throwing • catching the ball is as important 2. They must have a better control of the ball: • together participants will practice attacking over the net	Manage an overarm throw safely and working co-operatively Control the ball in different game situations	20 Volleyballs 40 Cones Pitch Net	They need to improve the catchball serve by throwing the ball They need to improve their catchball skills by developing their ball control
Activities	1. Warm-up game: Participants will play at the same time Traffic lights: • one whistle- walking with passing the ball from one hand to the other hand, throwing up in the air the ball minimum 2 meters • two whistles- throwing the ball in the air with one hand and then catching with both hands • three whistles- footwork, move the right foot to right side of the body, move the left foot to the left side of the body and then jump and landing on both legs			5 minutes all over the volleyball court

2. Warm-up exercises: Participants will practice at the same time			
• ankle jogging			3 times of 5 repeat
• stepping with knees up			3 times 5 meters
• stepping with heels back			3 times 5 meters
• skipping			3 times 5 repeat
• big steps			3 times 5 meters
• stretching			6 minutes
3. Development:			
a. Practice individually:			
throw the ball to partner with your handy hand			4 times
throwing over the head with both hands in the air and catching with both hands			4 times
b. Practice in pairs throwing: Participants will practice at the same time			
• practice in pairs underarm throwing the ball to each other by increasing the distance			4 times
• one throws the ball over the net and the other one catches the ball			4 times
c. Practice footwork , changing direction:			4 times
• right foot to right side of the body			
left foot to the left side of the body			
• jumping and landing on both legs			

	• jumping again with throwing the ball over the net with both hands			
	d. Practice in pairs attacking:			
	• attacking in pairs with footwork movement without net and then over the net to each other			4 times
	e. Play a set: scoring only if there are three passes inside each team			1 set up to 21 points
Cool-down every 20 min	Sleeping lions			3 minutes

WEEK 3 Attack and spiking

Objectives

1. Improving the attack over the net
2. Exercise spiking the ball

Time: up to 1,5 hours		Outcomes	Resources	Comments
Main Teaching	1. They must co-operate as a team • together participants will practice the attack by increasing the ball control • each participant will make three steps parallel with the net and the last one will be a jump • after getting familiar with the three steps and jumping, participants will spike as close as possible in the opponent field 2. To use three passes of catch before scoring • together participants will play a game using the skills they learned	1. Control the ball as the catching and throwing inside the team by understanding how to pass the ball with both hands 2. Improve their catchball actions by co-operate with the team in spiking	20 Volleyballs 40 Cones Pitch Net	1. They have improved their catchball actions by playing with more confidence 2. They have increased the ball control by improve their throwing skills

Activities	1. Warm-up game: Participants will play at the same time Applause • Throw the ball in the air and clap as many times you can, before you catch the ball			5 minutes all over the volleyball court
	2. Warm-up exercises: Participants will play at the same time			
	• ankle jogging			3 times of 5 repeat
	• stepping with knees up			3 times 5 meters
	• stepping with heels back			3 times 5 meters
	• skipping			3 times 5 repeat
	• big steps			3 times 5 meters
	• stretching			7 minutes
	3. Development:			
	a. Practice individually:			
	throwing over the head with both hands in the air and catching with both hands			4 times
	throw the ball against the wall and over the net with a handy hand as well			4 times
	b. Practice in pairs passing:			
	• throw the ball with both hands over the head towards the partner increasing the distance between both of you			4 times
	• throw the ball with a handy hand towards the partner to catch by increasing the distance between both of you			4 times
	• one participant throws the ball over the net and the other one catches the ball			4 times

	attacking in pairs with footwork without net and then over the net to each other			4 times
	c. Practice footwork , quickly changing direction:			4 times
	right foot to right side of the body			
	left foot to the left side of the body			
	jumping and landing on both legs			
	jumping again with throwing the ball over the net with both hands			
	d. Play a game by scoring only if there are three passes inside each team			3 sets up to 11 points
Cool-down every 20 min	Breathing and stretching			3 minutes

WEEK 4 The serve and defense

Objectives

1. Performing the serve and defense skills
2. Performing the game by the catchball rules

Time: up to 1,5 hours		Outcomes	Resources	Comments
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Main Teaching	1. Perform the serve and defense tactics: - participants will practice the serve with one or two hands - then they will practice defense and the block of one, two and three participants - one team will attack in the same place of the net and the other team will block 2. They must use three passes before scoring - together participants playing the game using the skills and the rules they have learned	1. Increase the control of serve and attack by understanding how to throw the ball with a handy hand and how to attack in front of the net 2. Co-operate with a partner to use three passes before scoring	20 Volleyballs 40 Cones Pitch Net	1. They have improved their serving and attacking skills 2. They increase the ball control playing with more confidence
Activities	1. Warm-up game: Participants will play at the same time Traffic lights: • one whistle- throw and catch the ball with one hand • two whistles- throw and catch catch the ball with both hands • three whistles- walk freely around the volleyball court, take a ball and then with the footwork perform the attack in front of the net throwing the ball over the net			5 minutes all over the volleyball court
	2. Warm-up exercises: Participants will play at the same time			
	• ankle jogging			2 times of 5 repeat
	• running with knees up, then running with heels back			2 times 5 meters
	• skipping			2 times 5 repeat
	• big steps			2 times 5 meters
	• stretching			minutes
	• 3. Development:			5

	a. Practice individually:			
	throw the ball over the head with both hands in the air and catching with both hands			3 times
	• throw the ball with one hand in the air and catching with both hands			3 times
	• throw the ball over the net with one hand			times
	• b. Practice footwork , quickly changing direction:			3 3 times
	right foot to right side of the body			
	• left foot to the left side of the body			
	• jumping and landing on both legs			
	• jumping again with throwing the ball over the net with both hands			
	• c. Practice in pairs the serve and the attack:			
	one participant serves towards the partner who catches the ball with both hands by increasing the distance between them			3 times
	• each participant who holds the ball with both hands start doing the footwork to perform the attack in front of the net and then throw the ball over the net			3 times
	• pass the ball towards a partner who is in front of the net with his/her back, catch the ball from him/her and then perform the attack throwing the ball over the net			times
	• d. Play a game by the rules			3 sets up to 21
	Breathing and stretching			3 minutes
Cool-down every 20 min				

Appendix 4: Type 2 Diabetes Exercise Action Plan⁶

Type 2 Diabetes Exercise Action Plan (on Insulin and/or Sulphonylureas)	
This resource is designed to be used by an Exercise Specialist with diabetes knowledge.	
Guidelines for Starting Exercise	
Glucose Level:	OK to exercise
* Ensure medication taken as prescribed. * Ensure adequate fluid intake	* Have blood glucose level monitor * Avoid exercise in extremes of temperature * If previous foot or nerve problems check feet before and after exercise. * If taking sulphonylureas, risk of hypoglycaemia is increased when exercising after a meal
Establish glucose trend by measuring glucose levels 2-3 times (e.g. every 30 mins) before exercise. If glucose level is falling and it has been >90 min since eating, then consider one serve of slow acting carbohydrate – dependent on duration and intensity of exercise, the carbohydrate intake and glucose level prior to starting exercise.	
5.5 – 15.0mmol/L	If on insulin – carry one serve of fast acting carbohydrate when exercising, especially when > 60min. If on a sulphonylurea – carry one serve of slow acting carbohydrate when exercising, especially when > 60min.
Glucose Level:	Below target glucose – Delay exercise or do not exercise
4.0 – 5.4mmol/L	Delay Exercise – Consume one to two serves of fast acting carbohydrate. - If accustomed to exercise and their own glucose response to this starting level = may start exercising. Follow with slow acting carbohydrate if exercise duration >30 min and/or next meal is more than 30 min away. Monitor glucose trend during exercise. - If unaccustomed to exercise and/or glucose response to starting level, wait 15 min after consuming the carbohydrate and then re-test. OK to exercise when glucose ≥ 5.5 mmol/L and feeling well. Follow with slow acting carbohydrate if exercise duration >30 min and/or next meal is more than 30 min away. Monitor glucose trend during exercise.
Glucose Level:	Hyperglycaemia, but feel well – Exercise with caution
>15.0mmol/L	If Likely Due to Food – If feeling well and usual medications have been taken – perform exercise with caution (may be beneficial in lowering glucose). Monitor the glucose level during exercise and increase fluid intake. If Likely Due to Missed Medication – If feeling well – low-intensity exercise only and catch up on missed medications as soon as possible and increase fluid intake.
Glucose Level:	Hypoglycaemia or Hyperglycaemia - Do not exercise or delay exercise
DO NOT EXERCISE – If hypoglycaemic event within the previous 24 h that required assistance from another individual to treat the event. DO NOT EXERCISE – If hypoglycaemic event within the previous 24 h that did not require assistance but the intended exercise is potentially unsafe (e.g. swimming, skiing, surfing, etc.). DO NOT EXERCISE UNTIL SYMPTOMS IMPROVE – If feeling unwell (e.g. abnormal sweating, trembling, anxiety, hunger, weakness, dizziness, inability to think straight)	
<4.0mmol/L	Delay Exercise – Treat hypoglycaemia: Consume one serve of fast acting carbohydrates and re-test after 15 min. If still wishing to exercise, ensure glucose level is ≥ 5.5 mmol/L and follow up with one serve of slow acting carbohydrate. Do low to moderate intensity exercise and closely monitor glucose, re-test every 15 min. DO NOT EXERCISE – If alone or type of exercise is potentially unsafe (e.g. swimming, skiing, surfing, etc.). If glucose level is frequently <4.0mmol/L, schedule review with a Diabetes Healthcare Professional.
>15.0mmol/L	DO NOT EXERCISE – If feeling unwell, tired, weak, thirsty and/or frequently urinating. If glucose level is frequently >15.0mmol/L, schedule review with a Diabetes Healthcare Professional.
Fast Acting Carbohydrate (15g=one serve) examples: One serve as initial treatment - 100mL Lucozade - 3 teaspoons honey, jam or sugar - 3 glucose tablets - 7 small or 4 large jelly beans - 150mL fruit juice or soft drink - 30mL cordial (non diet) mixed with 150mL water	
Slow Acting Carbohydrate (15g=one serve) examples: One serve as follow up treatment - 250mL plain milk - 2 sweet plain biscuits - 1 tub (200g) yoghurt - 1 piece of fruit - 1 slice of bread - next meal (if served within 30 min)	
Guidelines for During Exercise	
- Trained individuals have greater reductions in glucose during aerobic exercise than individuals with reduced cardiorespiratory fitness. - High-intensity exercise or resistance exercise before aerobic exercise will attenuate the decrease in glucose compared to aerobic exercise alone. - Completing an aerobic exercise cool down after high-intensity or resistance exercise will attenuate the glucose rise compared to performing high-intensity or resistance exercise alone.	
Glucose Level:	Below target glucose - Exercise with caution
<5.5mmol/L	- Consume fast acting carbohydrates if next meal not planned within 30 min – one serve per hour with gentle exercise, two serves per hour with moderate-intensity exercise, four serves per hour with vigorous or high-intensity exercise. Alternative approach = 0.3-0.5g carbohydrate per kg of body mass per hour with reduced insulin. If this occurs frequently, schedule review with Diabetes Healthcare Professional.
Glucose Level:	Rising glucose - Exercise with caution
Rises above pre-exercise level	- Ensure medications have not been missed. - Rise is more likely with higher intensity exercise such as weight lifting, sprints and racing. - Rise may also be due to food consumed within the last 90 min. - Monitor the rise but be prepared for the fall in the glucose later – may require correction in carbohydrate consumption and/or insulin after exercise.
Glucose Level:	Hypoglycaemia - Not safe to continue exercise
<4.0mmol/L	STOP EXERCISING – Consume one serve of fast acting carbohydrate and re-check after 15 min. If glucose is still <4.0mmol/L repeat one serve fast acting carbohydrate. Once glucose is ≥ 4.0 mmol/L consume one serve slow acting carbohydrate if next meal is more than 30 min away. - Only resume exercise when glucose is ≥ 5.5 mmol/L. - If this occurs frequently, schedule review with a Diabetes Healthcare Professional.
Guidelines for After Exercise	
- Risk of hypoglycaemia is elevated for at least 12 h after exercise. Monitor glucose after exercise if there has been an increase in exercise or when performing new exercise. - If post-exercise hypoglycaemia occurs, treat and confirm resolution then check the glucose level at least every 2 h up to 6 h post exercise. - Additional monitoring (e.g. for night-time hypoglycaemia) is required when exercising in extreme heat, cold or high altitude, changing exercise type/duration/intensity, and if post-exercise hypoglycaemia has previously occurred. - If exercising in the afternoon, monitor for the risk of night-time hypoglycaemia. - If night-time hypoglycaemia occurs, check the glucose level before sleep, once during the night (e.g. 2:00 am), and immediately upon waking. - If glucose level <7mmol/L before bed, extra carbohydrates should be consumed. - Adjustment of insulin with post exercise meal or additional carbohydrates following exercise may be required.	
If the glucose level is of concern and/or is within orange or red areas of the Action Plan recurrently, the following should be discussed and reviewed with a Diabetes Healthcare Professional.	
- Type of medications to lower glucose - Timing of medications - Glucose trend prior to exercise - Timing and amount of previous food intake - Presence and severity of diabetes complications - Use of other medications secondary to diabetes - Intensity, duration and type of exercise - Time of day conducting exercise	

Fig. 2 Type 2 Diabetes Exercise Action Plan (on insulin and/or sulphonylureas). A distinct PDF of this figure can be viewed in Additional file 2

⁶ Grant Turner et al. - Resources to Guide Exercise Specialists Managing Adults with Diabetes, in *Sports Medicine* – Open, <https://doi.org/10.1186/s40798-019-0192-1>